

July 30, 2003

FCC Docket 03-104

Comment by Jeffrey P. LaCrosse, Ph.D.
214 Argonne Drive
Durham, NC 27704

“Broadband over Power Line” (BPL) technology, while at first glance seems very promising and exciting, is a potential bomb that will disrupt communications from AM radio through VHF bands, where existing vital public, commercial, government and amateur communications occur.

If one studies the physics of RF transmission over widely spaced power lines, one can easily compute that the existing power line infrastructure would behave better as an antenna than a transmission line for BPL signals in the MHz range. Power lines were originally designed for 60 Hz power transmissions, not for MF, HF and VHF signals. We cannot escape the fundamental physics or engineer the BPL system to eliminate emission of these signals at all frequencies of concern.

From my limited studies of the various radio allocations, it was made clear in the early days of cable TV, that signal leakage issues were of the greatest concern to prevent interference between public and government allocations, namely aircraft communications in the 108-136 MHz range. Why should BPL be allowed in this context? By allowing BPL, this may encourage other groups who previously were held to high standards of signal integrity to petition to relax their standards, which would lead to an electromagnetic nightmare of interference.

Based on the various studies [1] conducted to date, by ARRL and other groups, it is clear that BPL signal emissions will be up to 65 dB greater than background noise for a typical amateur station [1]!! Non-amateur allocations in the same spectral range would also suffer a similar fate.

There are many other ways to transmit data as you well know: telephone line (dial-in and DSL), cable TV modem and via satellite. While telephone line is a lossy transmission line at MHz frequencies, the proximity of the signal wires is close that emissions are negligible. Cable signals are wideband, but shielded, also resulting in normally immeasurable emissions. While it is commendable to the FCC to consider another option for consumers, it is not worth the potential cost in disrupted communications.

Not being an expert in Part 15 device regulations, it is clear to this commenter, however, that it would take substantial power to drive a MHz signal through a power line to combat the significant losses that occur from signal emission and losses from power transformers (designed for 60 Hz), etc. Since power lines are physically considered more of an antenna than a transmission line, this power would have to be considered as radiated power, since the amount needed at the receiver at the other end is negligible. This commenter suspects that these power levels would be greater than the Part 15 allowances. I believe the ARRL and other studies verify this suspicion. The duty cycle limitation would have to be exceeded in order to obtain the bandwidth necessary for competitiveness with the other modes of digital communication currently available.

Comment on Docket 03-104
Jeffrey P. LaCrosse, July 30, 2003

While the BPL industry can place filtering devices to block out emission for key frequencies, this will drastically reduce the bandwidth of the signal and not prevent possible generation of new frequencies from the non-linear behavior of power transformers and other devices originally designed for 60 Hz operations. As long as there is some region above LF that is not filtered, there exists the potential for interference with some vital communications service.

It goes without saying the importance of the current licensed services that would bear the interference of the BPL signals. One of the most overlooked services is the amateur service. In North Carolina, the experiences from recent hurricanes Fran in 1996 and Floyd in 1999 illustrate the vital importance of amateur communications when all other services are temporarily disabled. The amateur service also has gained further notice with its commitment to provide emergency communications in response to terrorist attacks. What is wonderful about the amateur service is that its costs are borne by the amateurs themselves. No charge to the public. What more could the public ask for? In North Carolina, from my experience, the public has come to expect the presence of "ham" radio operators in times of emergency.

This commenter urges the FCC not to allow BPL. BPL will cause substantial interference to existing licensed services and most likely reduce the effectiveness of current licensed services.

With Highest Regard,

Jeffrey P. LaCrosse, Ph.D.

214 Argonne Drive
Durham, NC 27704
Amateur Radio Station WD9IHI